DOCUMENT RESUME

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ABSTRACT

A collection of 96 mathematics items are presented for state and local education agencies to draw upon in designing their own minimal competency tests. These items, part of the National Assessment of Educational Progress, have been reviewed in terms of their appropriateness for a minimal competency test for high school graduation. The items are arranged according to content areas: (1) number and numeration concepts; (2) properties of numbers and operations; (3) arithmetic computation; (4) estimation and measurement; (5) algebraic expressions; (6) probability and statistics; (7) geometry; (8) business and consumer mathematics; and (9) methods of presenting data. Sixty-four items are presented in a multiple choice format; 32 items are open-ended and require hand scoring. The correct response is also given for all items. The age group or groups designated by the reviewers (9 year olds, 13 year olds, 17 year olds, or adults--26-35 years old), and the percentage of students in the nation who responded correctly are indicated for each item. (BH)

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MATH RESOURCE ITEMS FOR MINIMAL COMPETENCY TESTING

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National Center for Education Statistics

NAEP

MATH RESOURCE ITEMS

FOR

MINIMAL COMPETENCY TESTING

A collection of math items for state and local education agencies to draw upon in custom-building their own minimal competency instruments

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

December 1977

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National Assessment of Educational Progress
Education Commission of the States
Suite 700, 1860 Lincoln Street
Denver, Colorado 80295

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

MATH RESOURCE ITEMS
FOR
MINIMAL COMPETENCY TESTING

I. The Demand for Minimal Competency Testing Materials

Mandates for minimal competency testing are stemming from state legislatures, state and local boards of education and concerned parents and taxpayers. Month-by-month the demand for suitable testing materials in the basic skills area continues to grow. Some states and districts are looking for instruments that can be used for grade-to-grade promotion while others are primarily interested in competency testing for high school graduation. As a result, National Assessment receives requests daily for information concerning minimal competency programs and related test instruments.

National Assessment has prepared the attached set of math items in response to this growing interest for item resource pools that can be used by state and local education agencies to custom-build their own instruments. This is not an all-inclusive resource pool of minimal competency math items; we do hope, however, that you will find the items useful as you develop your own, more complete, instrument.

II. The Relationship of National Assessment to Minimal Competency Testing

National Assessment is not designed to measure minimal competency skills. National Assessment's primary goal is to measure the changes that occur in educational achievement over time. Ten learning areas are periodically assessed and the survey findings are reported to educators and the general public. The items used by National Assessment are intentionally developed to measure a broad range of educational attainments. Some items are very difficult and relatively small numbers of students tested are expected to respond correctly. Other items are fairly basic and in these cases, many of the students are able to respond correctly. While most of the assessment items are presented in a multiple-choice format, some are open-ended and require hand scoring and some items even call for individual administration or taping of student responses. Four age groups are assessed: 9-year-olds, 13-year-olds, 17-year-olds and adults (26-35). Certain items are administered to only one age-group while others are given to two or more of the age-groups so that data comparisons can be made.

With this background information in mind, it becomes clearly evident that National Assessment was not designed specifically for minimal competency testing. It is extremely important to keep reminding yourself and others of this fact as you begin your review of the math items.

III. The Selection of the NAEP Minimal Competency Resource Math Set

In response to the demand for minimal competency materials, National Assessment asked eight state and local representatives to look at its released item pool of 240 items to see if there might be some items that could be considered appropriate for testing high school students. Each math item was reviewed in terms of its appropriateness to be used as a resource by states/districts in developing minimal competency tests for high school graduation. We were not asking for a definitive statement describing minimal competencies or attempting to set standards or passing scores or expecting to develop a complete math minimal competency test. These outcomes were not considered essential to the task at hand. Simply stated, we were interested only in identifying items that might be appropriate for others to consider when developing their own instruments for testing high school students.

The appropriateness of each item was rated by the reviewers as either "Yes-Maybe-No." Many items received unanimous ratings as being appropriate. Needless to say, others received unanimous ratings as being inappropriate. This was expected, since the NAEP items were originally developed to measure a broader range of knowledges, skills and abilities than implied by minimal competency testing. Also, as expected, some items received both "Yes" and "No" ratings and several solicited "Maybe" ratings.

This overview of the review and rating process helps to point out the diversity that does exist in defining minimal competency testing. To some, the primary emphasis is on academic skills while for others the major emphasis is application skills. Yet another dimension goes beyond the 3-R's and includes basic life or survival skills in such areas as health, interpersonal relations, communications, the arts, etc. The review process was most educational and enlightening. Many of you have undoubtedly already experienced similar situations or if not, will most likely experience them in the near future.

IV. The Content of the NAEP Minimal Competency Resource Math Set

The attached set contains 96 items that received a "Yes" rating from half or more of the reviewers (40% of the total 240 math items reviewed). The arrangement of the set of items, type of items, NAEP results, etc. is described below:

A. Arrangement of the Items

The items are sequenced according to math content areas. As shown in the table, some content areas have several items and other content areas have a very limited number of items. These math content areas are quite broad in scope and it is likely that a particular item could be classified under more than one content area. You may want to consider this as you begin to build your testing instrument.

CONTENT AREA	Number of Items	Item Numbers
A. Number and Numeration Concepts	3	MC A01 thru A03
B. Properties of Numbers and Operations	4	MC B01 thru B04
C. Arithmetic Computation	33	MC C01 thru C33
D. Estimation and Measurement	21	MC D01 thru D21
E. Algebraic Expressions	1	MC E01
F. Probability and Statistics	6	MC F01 thru F06
G. Geometry	10	MC G01 thru G10
H. Business and Consumer Math	10	MC H01 thru H10
I. Methods of Representing Data	8	MC I01 thru I08

B. Type of Items

Two-thirds of the items (64) are presented in a multiple-choice format. The correct response is indicated by the darkened oval. One-third of the items (32) are open-ended and require hand scoring. The correct response has been written on the answer line.

C. National Assessment Results

The age group(s) assessed by National Assessment and the percent of students in the nation who responded correctly is indicated on each item. This information may be of interest as you review the appropriateness of the items for use in your minimal competency testing program.

NOTE: National Assessment results are reported on an item-by-item basis. Since all items are not given to the same group of students, National Assessment is not able to report an overall test score, i.e., the percent of 17-year-olds who responded correctly to all items or the percent who responded correctly to say, 60% or 90% of the items.

V. Your Comments

We would be very interested in receiving your comments on the appropriateness of the math items for your minimal competency testing program. Do the open-ended items present a scoring problem? Are there important math content areas not covered by the items? Is your program geared towards academic skills or application skills or both? How many of the items will you be able to use?

Please sent your comments to: National Assessment of Educational Progress
Department of Field Services
1860 Lincoln Street, Suite 700
Denver, Colorado 80295

MC
A01 A. What fractional part of the figure below is shaded?

AGE	%
9	31

ANSWER 1/4

B. What fractional part of the figure below is shaded?

AGE	%
9	31

ANSWER 1/3

C. What fractional part of the figure below is shaded?

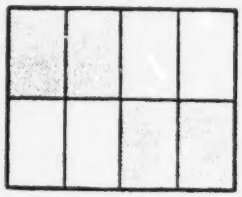
AGE	%
9	31

ANSWER 2/5

(MC-A01 continued)

D. What fractional part of the figure below is shaded?

AGE	%
9	37



ANSWER 1/2

MC
A02 Which one of the following expresses $10,347 to the nearest one hundred dollars?

AGE	%
13	63

- ○ $10,000
- ● $10,300
- ○ $10,350
- ○ $10,400

- ○ I don't know.

MC
A03 $\frac{1}{5}$ is equivalent to what percent?

AGE	%
17	63

- ○ $\frac{1}{5}$%
- ○ 5%
- ○ 15%
- ● 20%

- ○ I don't know.

MC
B01 What number is 1000 more than 3425?

- ⬭ 3425
- ⬭ 4325
- ⬬ 4425
- ⬭ 3525

- ⬭ I don't know.

AGE	%
13	85
17	89

MC
B02 A. Which number is the GREATEST?

- ⬭ 0.5
- ⬬ 5.0
- ⬭ 0.005
- ⬭ 0.05

- ⬭ I don't know.

AGE	%
13	82
17	93

B. Which number is the SMALLEST?

- ⬭ 2.002
- ⬭ 0.202
- ⬭ 0.22
- ⬬ 0.022

- ⬭ I don't know.

AGE	%
13	50
17	76

MC
B03 A. Which number is GREATER?

- [x] 3,000,000
- [ ] 800,000
- [ ] I don't know.

AGE	%
9	82
13	96

B. Which number is GREATER?

- [ ] 3,000
- [x] 3,200
- [ ] I don't know.

AGE	%
9	86
13	97

$$\begin{array}{r} 315 \\ -179 \\ \hline 136 \end{array}$$

MC
B04 What two numbers should you add to check the above subtraction?

- [x] Add 136 to 179
- [ ] Add 136 to 315
- [ ] Add 179 to 315
- [ ] I don't know.

AGE	%
13	78
17	90

MC
C01 Do the problems below.

A. Add:

$$\begin{array}{r} 38 \\ +19 \\ \hline \end{array}$$

AGE	%
9	79
13	94
17	97
Adult	97

ANSWER 57

B. Subtract:

$$\begin{array}{r} 36 \\ -19 \\ \hline \end{array}$$

AGE	%
9	55
13	89
17	93
Adult	92

ANSWER 17

C. Multiply:

$$\begin{array}{r} 38 \\ \times\ 9 \\ \hline \end{array}$$

AGE	%
9	25
13	83
17	90
Adult	81

ANSWER 342

D. Divide:

$5\overline{)125}$

AGE	%
9	15
13	89
17	95
Adult	93

ANSWER 13 25

MC
C02 Do the following subtraction:

1,054
- 865

AGE	%
9	27
13	80
17	91
Adult	90

ANSWER 189

MC
C03 What is the result of the following subtraction?

$18.08
- .99

- ○ $16.19
- ● $17.09
- ○ $17.19
- ○ $18.09

- ○ I don't know.

AGE	%
13	77

MC
C04 If 23.8 is subtracted from 62.1, the result is

- ● 38.3
- ○ 48.3
- ○ 49.3
- ○ 85.9

- ○ I don't know.

AGE	%
13	74

$ 3.06
10.00
9.14
5.10

MC
C05 What is the sum of the amounts of money shown above?

- ⬭ $17.20
- ⬭ $17.30
- ▬ $27.30
- ⬭ $27.20
- ⬭ $28.30

- ⬭ I don't know.

AGE	%
13	87
17	90

MC
C06 What is the sum of these numbers?

19, 757, 8, 65, 199

- ⬭ 948
- ⬭ 1028
- ▬ 1048
- ⬭ 1127

- ⬭ I don't know.

AGE	%
17	77

MC
C07 Which number is CLOSEST to the number 28?

- ⬭ 20
- ⬭ 25
- ▬ 30
- ⬭ 35

⬭ I don't know.

AGE	%
9	68

MC
C08 What is the result of the following multiplication?

$$\frac{1}{2} \times \frac{1}{4} =$$

- ▬ $\frac{1}{8}$
- ⬭ $\frac{2}{8}$
- ⬭ $\frac{3}{4}$
- ⬭ 8

⬭ I don't know.

AGE	%
13	77
17	81

$15\overline{)345}$

MC
C09 What is the result when you divide the above numbers?

- ⬭ 13
- ⬭ 22
- ▬ 23
- ⬭ 25

- ⬭ I don't know.

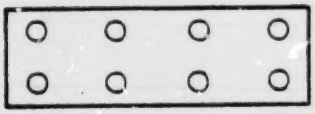
AGE	%
13	80

MC
C10 $12 \div 2.4 =$

- ⬭ 0.005
- ⬭ 0.05
- ⬭ 0.5
- ▬ 5.0

- ⬭ I don't know.

AGE	%
17	49



MC
C11 If one-fourth of the dots in the above figure are removed, how many dots will be left?

AGE	%
9	21

ANSWER 6

MC
C12 10 X 10 X 10 X 10 =

AGE	%
9	4
13	67
17	81

ANSWER 10,000 or 10 to the 4th power

MC
C13 An astronaut is to orbit the earth in a space capsule for seven days. If he drinks three pints of water each day, how many pints of drinking water will he need for the trip?

AGE	%
9	46

ANSWER 21

MC
C14 Betty's dog eats two biscuits every day. How many days will it take the dog to finish a package of 24 biscuits?

AGE	%
9	37

ANSWER 12

MC
C15 The air temperature on the ground is 31 degrees. On top of a nearby mountain, the temperature is -7 degrees. How many degrees difference is there between these two temperatures?

AGE	%
13	39
17	67
Adult	67

ANSWER 38 or -38

MC
C16 Weathermen estimate that the amount of water in nine inches of snow is the same as one inch of rainfall. A certain Arctic island has an annual snowfall of 1,602 inches. Its annual snowfall is the same as an annual rainfall of how many inches?

AGE	%
13	31
17	54
Adult	58

ANSWER 178

MC
C17 Marie took four spelling tests. Each test had 30 words. On the four tests she spelled correctly the following numbers of words:

25, 23, 27, and 24.

Altogether, how many words did she MISS on all four tests?

AGE	%
9	16
13	60

ANSWER 21

MC
C18 A sports car owner says that he gets 22 miles per gallon of gasoline. How many miles could he go on seven gallons of gasoline?

AGE	%
17	90
Adult	90

ANSWER 154

MC
C19 If John drives at an average speed of 50 miles an hour, how many hours will it take him to drive 275 miles?

AGE	%
9	6
13	44
17	70
Adult	69

ANSWER 5 1/2

MC
C20 In a school election with three candidates, Joe received 120 votes, Mary received 50 votes, and George received 30 votes. What percent of the total number of votes did Joe receive?

AGE	%
13	17
17	46
Adult	47

ANSWER 60 %

MC
C21 Candidate A received 70 percent of the votes cast in an election. If 4,200 votes are cast in the election, how many votes did he receive?

AGE	%
13	10
17	43
Adult	62

ANSWER 2940

MC
C22 If there are 300 calories in nine ounces of a certain food, how many calories are there in a three-ounce portion of that food?

AGE	%
17	72
Adult	80

ANSWER 100

MC
C23 In one year, a government department spent the following sums on four projects:

Project A: $11,954,164
Project B: $ 1,126,055
Project C: $ 4,170,522
Project D: $ 750,572

Approximately how many MILLIONS of dollars were spent on these four projects? Give your answer to the nearest MILLION dollars.

AGE	%
17	54
Adult	63

ANSWER 18 million

MC
C24 A parking lot charges 35 cents for the first hour and 25 cents for each additional hour or fraction of an hour. For a car parked from 10:45 in the morning until 3:05 in the afternoon, how much money should be charged?

AGE	%
17	48
Adult	57

ANSWER $1.35

MC
C25 John has 382 stamps in his stamp collection, Greg has 224, Pete has 310 and Bob has 175. The number of stamps the boys have altogether is CLOSEST to which one of the following numbers?

- ⬭ 900
- ⬭ 1000
- ⬬ 1100
- ⬭ 1200

- ⬭ I don't know.

AGE	%
9	31

MC
C26 Mr. Johnson used 13 gallons of gasoline in driving 208 miles. How many miles to the gallon did he get?

- ⬭ 12 miles per gallon
- ⬭ 15 miles per gallon
- ⬬ 16 miles per gallon
- ⬭ 18 miles per gallon

- ⬭ I don't know.

AGE	%
17	81

MC
C27 In a certain company, 54 of the 85 employees are women. The percent of employees who are women is equal to

- ⬭ $\frac{54}{100}$
- ⬭ $\frac{100}{85}$
- ⬬ $100 \times (\frac{54}{85})$
- ⬭ $100 \times (\frac{85}{54})$
- ⬭ I don't know.

AGE	%
17	59

MC
C28 A salesman's commission on a car costing $2250 is $337.50. His commission is what percent of the cost?

- ⬭ 1.5%
- ⬭ 6.6%
- ⬬ 15%
- ⬭ 20%
- ⬭ I don't know.

AGE	%
17	33

MC
C29 A state changes its sales tax from 3 percent to 4 percent. How much ADDITIONAL sales tax would you now pay on a new car that costs $2,760.00?

- ⬭ $ 2.76
- ⬭ $ 11.04
- ⬬ $ 27.60
- ⬭ $110.40
- ⬭ I don't know.

AGE	%
17	44

MC
C30 Mr. Simmons put a wire fence all the way around his rectangular garden. The garden is nine feet long and five feet wide. How many feet of fencing did he use?

AGE	%
13	37

- ⬭ 14 feet
- ⬭ 23 feet
- ▬ 28 feet
- ⬭ 45 feet

- ⬭ I don't know.

MC
C31 A rocket was directed at a target 525 miles south of the launching point. It landed 624 miles south of the launching point. By how many miles did it miss its target?

AGE	%
13	63

- ⬭ 1 mile
- ▬ 99 miles
- ⬭ 101 miles
- ⬭ 109 miles
- ⬭ 1149 miles

- ⬭ I don't know.

MC
C32 Jim and his family took a 3 day trip. On the first day they drove 287 miles, on the second day they drove 302 miles, and on the third day they drove 95 miles. How many miles did they drive in the 3 days?

AGE	%
13	89

- ⊂ 589 miles
- ⊂ 674 miles
- ● 684 miles
- ⊂ 705 miles

- ⊂ I don't know.

MC
C33 If a jet plane flies at an average speed of 600 miles per hour, ABOUT how long will it take to travel 2975 miles? (Express your answer to the NEAREST WHOLE NUMBER of hours.)

AGE	%
13	51

- ⊂ 1 hour
- ⊂ 4 hours
- ● 5 hours
- ⊂ 178,500 hours

- ⊂ I don't know.

MC
D01 An angle may be measured in units called

- ○ centimeters.
- ● degrees.
- ○ grams.
- ○ inches.

- ○ I don't know.

AGE	%
9	15
13	69
17	91
Adult	82

MC
D02 Twenty minutes is what part of an hour?

- ○ $\frac{1}{2}$
- ● $\frac{1}{3}$
- ○ $\frac{1}{4}$
- ○ $\frac{2}{5}$
- ○ $\frac{1}{5}$

- ○ I don't know.

AGE	%
17	83

MC
D03 Which one of these means three hours after midnight?

- ⬭ 9 a.m.
- ⬭ 9 p.m.
- ▬ 3 a.m.
- ⬭ 3 p.m.

- ⬭ I don't know.

AGE	%
13	83

MC
D04 A worker went to his job at 7:45 a.m. and returned home exactly 10 hours later. At what time did he reach home?

- ⬭ 4:45 p.m.
- ▬ 5:45 p.m.
- ⬭ 7:55 p.m.
- ⬭ 8:45 p.m.

- ⬭ I don't know.

AGE	%
13	72

MC
D05 Sally worked from 4:25 p.m. to 5:00 p.m. How many minutes did she work?

- ▬ 35 minutes
- ⬭ 75 minutes
- ⬭ 125 minutes
- ⬭ 135 minutes

- ⬭ I don't know.

AGE	%
13	75

28

MC
D06 In one week Joe worked: 15 minutes on Monday
10 minutes on Tuesday
30 minutes on Wednesday
20 minutes on Thursday
45 minutes on Friday

In all, how much did he work during this week?

	AGE	%
⬭ 1 hour	13	63
⬭ 100 minutes		
▬ 2 hours		
⬭ 2 hours and 20 minutes		
⬭ 1 hour and 50 minutes		
⬭ I don't know.		

MC
D07 1 pound 8 ounces minus 10 ounces =

	AGE	%
⬭ 2 ounces	17	81
⬭ 8 ounces		
▬ 14 ounces		
⬭ 16 ounces		
⬭ I don't know.		

MC
D08 George was born on December 1, 1958, and Sara was born on May 1, 1961. How much older than Sara is George?

- ▬ 2 years, 5 months
- ⬭ 2 years, 6 months
- ⬭ 2 years, 7 months
- ⬭ 3 years, 4 months
- ⬭ 3 years, 5 months

- ⬭ I don't know.

AGE	%
13	10

MC
D09 A girl is 30 months old. What is her age in years and months?

- ⬭ 1 year, 24 months
- ⬭ 2 years, 0 months
- ▬ 2 years, 6 months
- ⬭ 3 years, 0 months

- ⬭ I don't know.

AGE	%
13	82

MC
D10 A gallon of asphalt paint will cover about 250 square feet of surface area. This paint is sold in gallon cans only. How many gallon cans are needed to paint a driveway 48 feet long and 10 feet wide?

- ▬ 2 gallon cans
- ⬭ 3 gallon cans
- ⬭ 250 gallon cans
- ⬭ 480 gallon cans

- ⬭ I don't know.

AGE	%
17	59

MC
D11 Curtains six feet seven inches long are needed for a set of windows. Which one of the following standard curtain lengths is CLOSEST to the length required?

- ⬭ 66 inches
- ⬭ 72 inches
- ▬ 84 inches
- ⬭ 90 inches

- ⬭ I don't know.

AGE	%
13	39
17	61

MC
D12 If you are calling your grandmother on the telephone, and the operator says, "Sixty-five cents, please." which set of coins would NOT total 65¢?

AGE	%
13	79

- ⬭ 6 dimes and 1 nickel
- ⬭ 2 quarters, 1 dime and 1 nickel
- ⬬ 1 quarter, 3 nickels and 2 dimes
- ⬭ 13 nickels
- ⬭ 3 dimes and 7 nickels

- ⬭ I don't know.

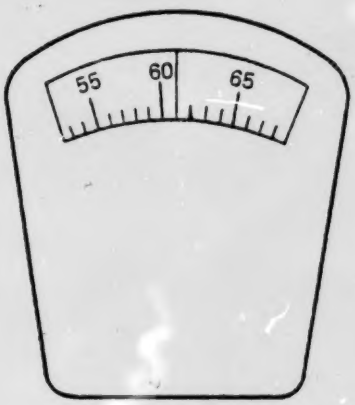
MC
D13 Joe gave a clerk a dollar for two dime candy bars and a nickel package of gum. If the tax was one penny, what change should he get back?

AGE	%
17	89

- ⬬ 2 quarters, 2 dimes and 4 pennies
- ⬭ 2 quarters, 1 dime and 4 pennies
- ⬭ 2 quarters, 4 nickels and 1 penny
- ⬭ 2 quarters, 2 nickels and 4 pennies

- ⬭ I don't know.

MC
D14 A person is standing on the scale below weighing himself. How much does he weigh?



- ⬭ 59 pounds
- ⬬ 61 pounds
- ⬭ 62 pounds
- ⬭ 63 pounds

AGE 13 % 90

- ⬭ I don't know.

MC
D15 Ginny's dress pattern calls for 72 inches of velvet ribbon. Ribbon is sold by the foot. Which one of the following will tell her how many FEET of ribbon she should buy?

- ⬭ 72 ÷ 3
- ⬭ (72 ÷ 3) × 12
- ⬬ 72 ÷ 12
- ⬭ 72 ÷ 36

AGE 13 % 73

- ⬭ I don't know.

MC
D16 If Independence Day comes on Monday, July 4, what is the date of the next Monday after Independence Day?

AGE	%
9	45

ANSWER July 11

MC
D17 If you have two nickels, one quarter and four pennies, how much money do you have all together?

AGE	%
9	68

ANSWER 39 cents

MC
D18 A man bought two pounds of cheese in eight-ounce packages. How many packages did he buy?

AGE	%
17	83
Adult	86

ANSWER 4

MC
D19 How many quarts are there in one gallon?

AGE	%
9	44
13	84

ANSWER 4

MC
D20 A turkey is to be cooked 20 minutes for each pound. If a turkey weighing $12\frac{1}{2}$ pounds is to be done by 5:00 p.m., what time should it be put in to cook?

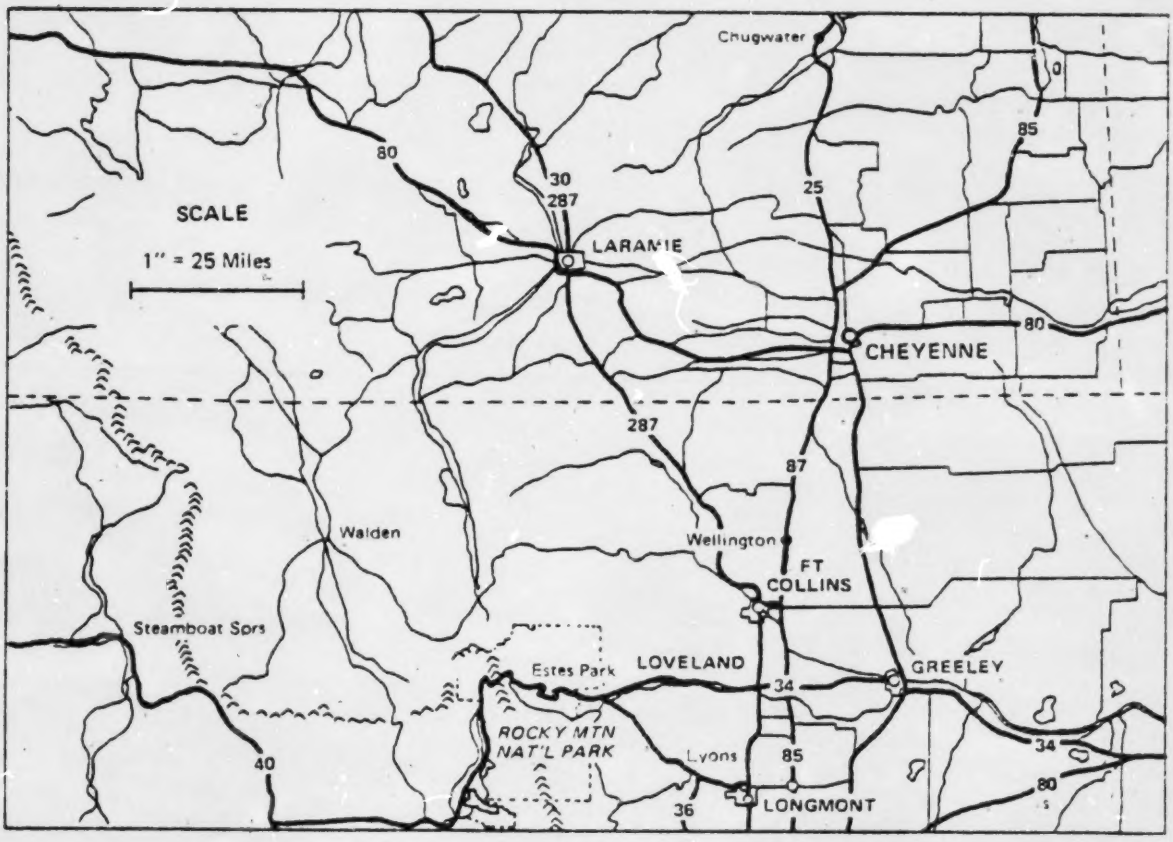
AGE	%
17	37
Adult	42

ANSWER 12:50 p.m.

MC
D21 If one inch is equivalent to 25 miles on the map shown below, about how far is it between Chugwater and Wellington? Use the ruler you have been given to find the answer.

AGE	%
13	74
17	87
Adult	86

ANSWER 74 to 76 miles



MC
E01 What is the LENGTH of a rectangle whose perimeter is 10 feet and whose width is 2 feet? The formula for the perimeter P of a rectangle of length L and width W is P = 2L + 2W.

- ⬭ 2 feet
- ⬬ 3 feet
- ⬭ 6 feet
- ⬭ 10 feet
- ⬭ 12 feet

- ⬭ I don't know.

AGE	%
17	41

3, 5, 8, 5, 12, 3, 8

MC
F01 To obtain the average (arithmetic mean) of the set of numbers above, their sum should be divided by

- ⬭ 4
- ⬭ 6
- ⬬ 7
- ⬭ 12
- ⬭ 44

- ⬭ I don't know.

AGE	%
13	56
17	69

MC
F02 To find the average (arithmetic mean) of a set of 5 numbers, it is correct to find the sum of the numbers and then

AGE	%
17	78

- ⬭ divide by 2
- ⬬ divide by 5
- ⬭ multiply by 2
- ⬭ multiply by 5

- ⬭ I don't know.

MC
F03 A student scored an average of 80 on the first 6 tests of a semester and an average of 74 on the next 3 tests. What was his average (arithmetic mean) for the 9 tests?

AGE	%
17	41

- ⬭ 74
- ⬬ 78
- ⬭ 80
- ⬭ 77

- ⬭ I don't know.

MC
F04 The probability is $\frac{1}{4}$ that patients with a particular disease will be cured by a certain medicine. Approximately how many cures would you expect in a random sample of 100 patients having this disease who are treated with this medicine?

AGE	%
17	86

- ⬭ 4
- ⬬ 25
- ⬭ 40
- ⬭ 75

- ⬭ I don't know.

MC
F05 At a carnival booth you can win a prize by guessing the color of a marble drawn from a jar. If you know that there are 25 red, 25 green, 25 yellow, and 25 blue marbles in the jar, what are your chances of winning a prize on your first try?

AGE	%
13	51

- ⬬ 1 out of 4
- ⬭ 1 out of 25
- ⬭ 4 out of 25
- ⬭ 25 out of 75

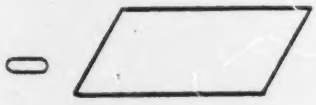
- ⬭ I don't know.

MC
F06 Last summer Todd earned $205, Charlotte earned $562, and Dale earned $400. What is the average of their summer incomes?

AGE	%
13	38
17	69
Adult	69

ANSWER $389

MC
G01 Which one of the following figures is a rectangle?



AGE	%
13	86

I don't know.

MC
G02 If the diameter of a circle is 16 inches in length, what is the length in inches of the circle's radius?

AGE	%
17	62

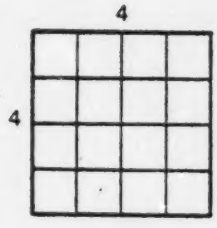
4 inches

8 inches

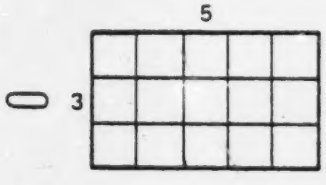
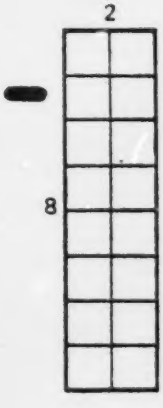
16 inches

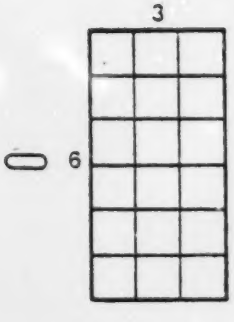
32 inches

I don't know.



MC
G03 Which one of the figures below has the same area as the figure above?





AGE | %
13 | 79

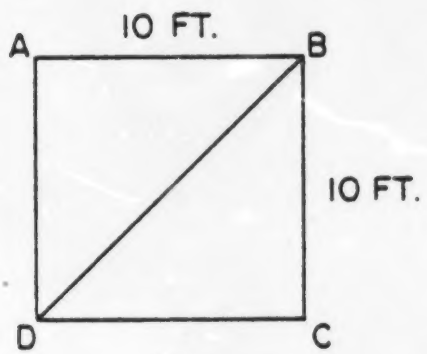
I don't know.

MC
G04 What is the diameter of a circle with a radius of four inches?

AGE	%
13	44

- ⬭ 2 inches
- ⬭ 4 inches
- ⬬ 8 inches
- ⬭ 16 inches

- ⬭ I don't know.



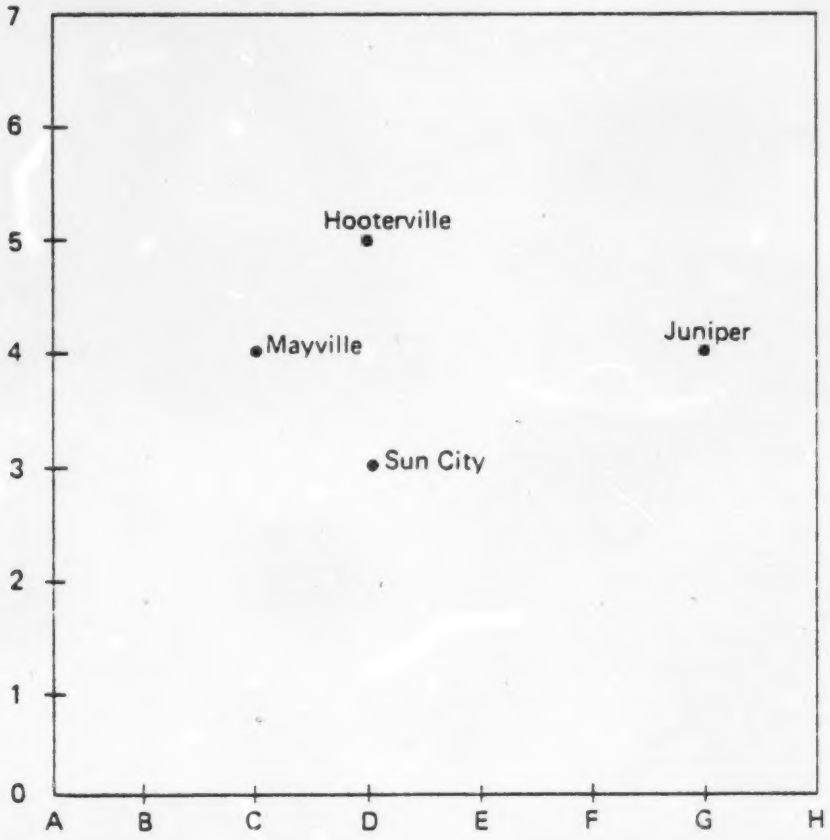
MC
G05 In the square pictured above, what is the AREA of triangle ABD?

AGE	%
17	37

- ⬭ 10 square feet
- ⬭ 20 square feet
- ⬬ 50 square feet
- ⬭ 100 square feet

- ⬭ I don't know.

MC
G06 The diagram below is part of a map.



A. (D, 3) locates which town?

AGE 13 % 97

- ⬭ Hooterville
- ⬭ Juniper
- ⬭ Mayville
- ⬬ Sun City

- ⬭ I don't know.

42

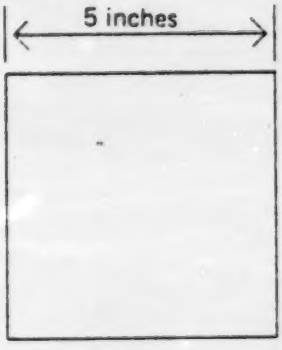
(MC-G06 continued)

B. Which coordinates locate Juniper?

AGE	%
13	95

- ⬭ (C, 5)
- ⬭ (D, 5)
- ⬬ (G, 4)
- ⬭ (G, 3)

- ⬭ I don't know.

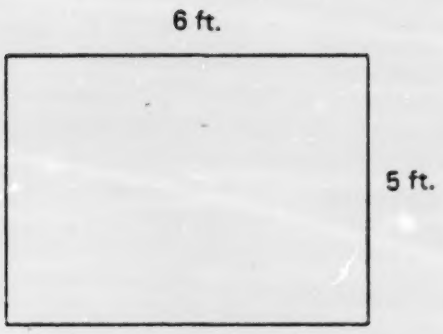


MC
G07 The total distance around the above square is

AGE	%
13	61

- ⬭ 4 + 5 inches
- ⬭ 5 + 5 inches
- ⬬ 4 X 5 inches
- ⬭ 5 X 5 inches

- ⬭ I don't know.

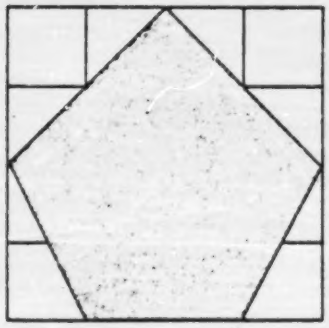


MC
G08 How many 1-foot-square tiles would be needed to cover a floor having the dimensions shown in the drawing?

- ⬭ 5 tiles
- ⬭ 6 tiles
- ⬬ 30 tiles
- ⬭ 300 tiles
- ⬭ I don't know.

AGE	%
13	85

MC
G09 ESTIMATE the shaded area of this figure in square units.



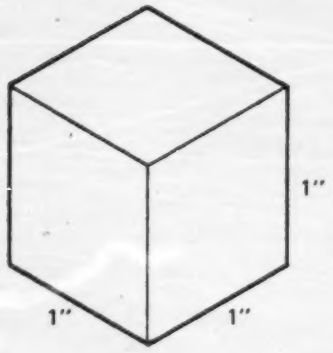
AGE	%
13	36

- ⬭ 8 square units
- ▬ 10 square units
- ⬭ 12 square units
- ⬭ 14 square units

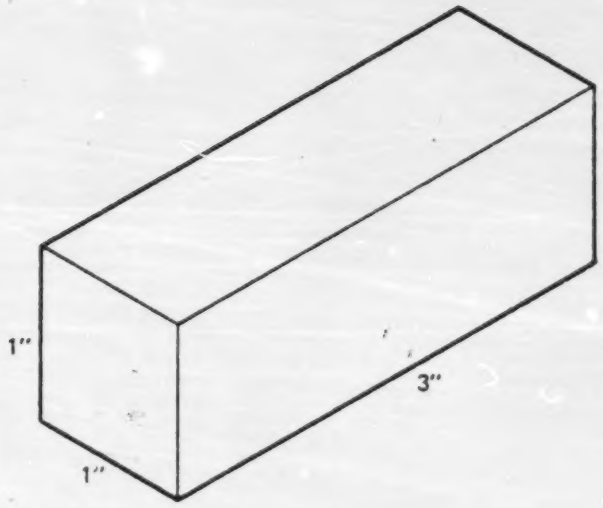
- ⬭ I don't know.

MC
G10 Look at the pictures below. How many blocks does it take to fill the crate?

BLOCK



CRATE



AGE	%
9	48
13	83

ANSWER 3

MC
H01 Manuel can buy a set of tires for his car for $127.00 cash. He can also get them on time payments for $11.00 down and $12.00 per month for a year. How much can he save by paying cash?

- ⬭ Nothing, the price is the same
- ⬭ $17.00
- ▬ $28.00
- ⬭ $38.00

- ⬭ I don't know.

AGE	%
17	66

MC
H02 A new automobile can be bought for cash for $2,850 or on credit with a down payment of $400 and $80 a month for three years. How much MORE would a person pay by buying on credit rather than by buying the car for cash?

- ⬭ $ 330
- ▬ $ 430
- ⬭ $2880
- ⬭ $3280

- ⬭ I don't know.

AGE	%
17	62

MC
H03 A real estate agent sold a house for $12,000. If his commission is 5% of the selling price, how much was the commission?

- ⬭ $6
- ⬭ $60
- ▬ $600
- ⬭ $4,000

- ⬭ I don't know.

AGE	%
17	72

MC
H04 If a city's property tax is $29.87 per $1,000 of assessed value, the tax on property assessed at $14,900 would be CLOSEST to which amount?

- ⬭ $400
- ⬭ $420
- ▬ $450
- ⬭ $470

- ⬭ I don't know.

AGE	%
17	39

MC
H05 A salesman was paid a commission of 15% for a sale of $3000.

How much money did he earn?

AGE	%
17	52

- ○ $ 20
- ○ $ 45
- ○ $200
- ● $450

- ○ I don't know.

MC
H06 Mr. Smith's bank book looks like this:

November 1	Balance (money in bank)	$ 36.23
November 16	Deposit (wages)	$100.00
November 25	Withdrawal (to buy new coat)	$ 28.00
December 1	Balance (money in bank)	$?

What is his December 1 balance?

AGE	%
17	86

- ○ $ 35.77
- ○ $ 91.77
- ● $108.23
- ○ $164.23

- ○ I don't know.

MC
H07 A housewife will pay the lowest price per ounce for rice if she buys it at the store which offers

- ○ 12 ounces for 40 cents.
- ○ 14 ounces for 45 cents.
- ● 1 pound, 12 ounces for 85 cents.
- ○ 2 pounds for 99 cents.

- ○ I don't know.

AGE	%
13	25
17	35
Adult	39

MC
H08 Television sets are on sale at two stores. One offers a 10 percent discount while the other offers 15 percent. What is the difference in the sale price at the two stores of a TV set that is regularly priced at $100?

AGE	%
13	49
17	77
Adult	86

ANSWER $5.00 or $85 and $90 (must show both answers)

MC
H09 A door-to-door salesman receives 20 percent of the retail value of his sales as commission. What must his total retail sales be if he is to earn a commission of $60?

AGE	%
17	38
Adult	57

ANSWER $300

MC
H10 A married couple with an adjusted gross income of $4,588 claim three exemptions on their federal income tax return, and elect to file a joint return. According to the tables below, how much tax must they pay?

TABLE 2.—Returns claiming TWO exemptions (and not itemizing deductions)

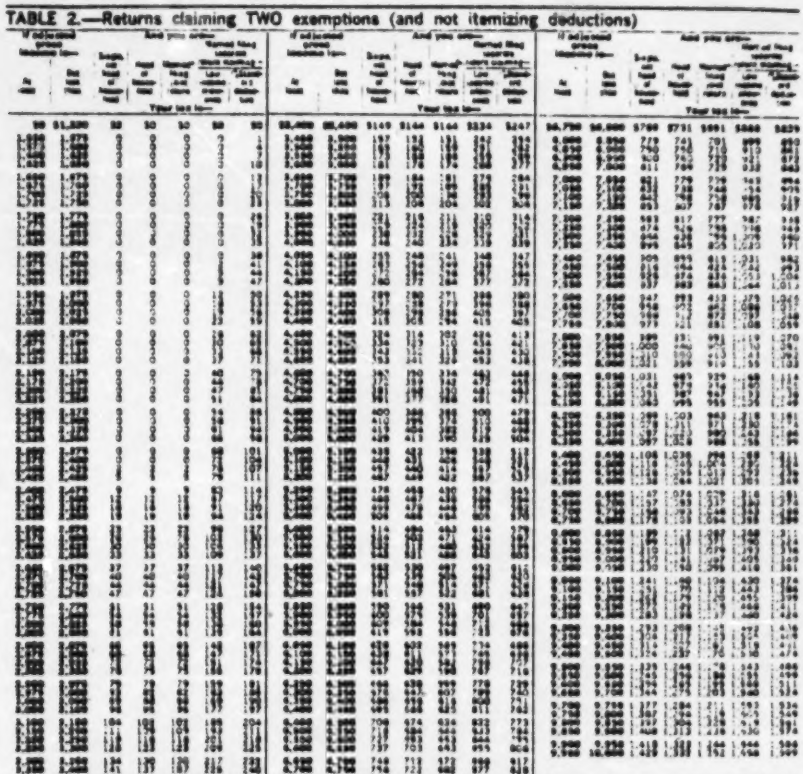
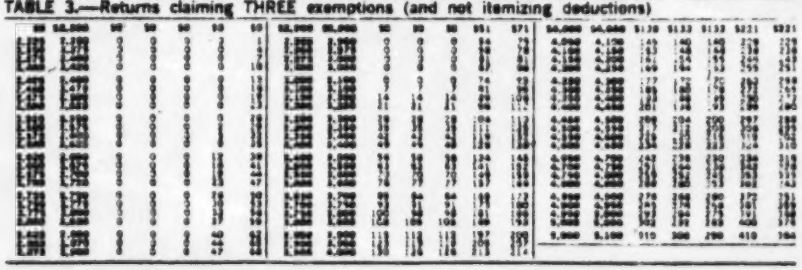


TABLE 3.—Returns claiming THREE exemptions (and not itemizing deductions)

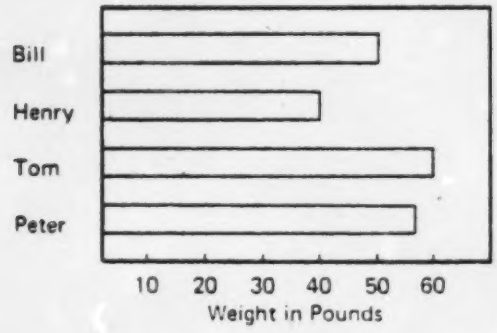


AGE	%
Adult	55

ANSWER $215

BEST COPY AVAILABLE

MC
101 This graph shows the weight in pounds of four boys.



A. Which boy weighs the most?

- ⬭ Bill
- ⬭ Henry
- ⬬ Tom
- ⬭ Peter

- ⬭ I don't know.

AGE	%
9	89

B. Which boy weighs closest to 50 pounds?

- ⬬ Bill
- ⬭ Henry
- ⬭ Tom
- ⬭ Peter

- ⬭ I don't know.

AGE	%
9	61

52

(MC-I01 continued)

C. Which boy weighs the least?

- ⬭ Bill
- ⬬ Henry
- ⬭ Tom
- ⬭ Peter

- ⬭ I don't know.

AGE 9 % 84

Number of Telephones in Operation in Various World Areas in 1968

(0 = 8 million telephones)

Area	No. of Telephones
North America	0000000000000000
Europe	000000000(
Asia	0000

MC I02 According to the chart, in 1968 the number of telephones in operation in North America was how many times the number of telephones in operation in Asia?

AGE 17 % 57
Adult 62

ANSWER 4

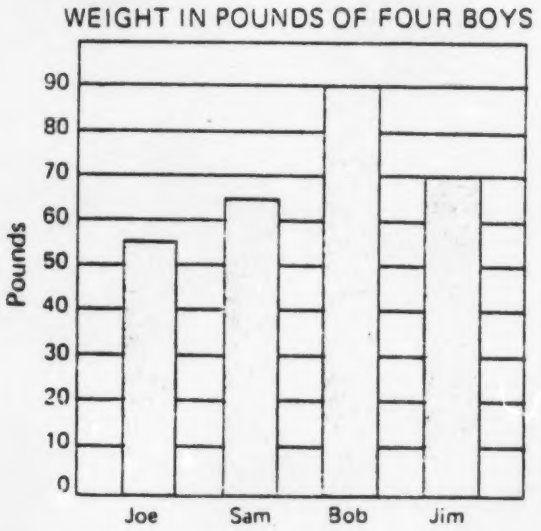
U.S. Rural Population for Nine Regions in 1970

Region	Rural Population (0 = 1 million persons)
1. New England	000
2. Middle Atlantic	0000000
3. East North Central	0000000000
4. West North Central	000000
5. South Atlantic	00000000000
6. East South Central	000000
7. West South Central	00000
8. Mountain	00
9. Pacific	0000

MC
I03 According to the chart, which TWO regions of the U.S. had the largest rural populations in 1970?

AGE 13 % 79

ANSWER 3 and 5



MC
I04 A. Which boy weighs the most?

- ⬭ Joe
- ⬭ Sam
- ⬬ Bob
- ⬭ Jim

- ⬭ I don't know.

AGE	%
13	99

B. How much does Jim weigh?

- ⬭ 60 pounds
- ⬬ 70 pounds
- ⬭ 80 pounds
- ⬭ 90 pounds

- ⬭ I don't know.

AGE	%
13	95

55

Federal Grants for Education 1966-1970

Year	Expenditures (□ = $500 million)
1966	□□□□□□□□□□□
1967	□□□□□□□□□□□□□
1968	□□□□□□□□□□□□
1969	□□□□□□□□□□□□□□
1970	□□□□□□□□□□□□□□□

MC
I05 According to the chart, for which year did federal grants for education decrease from the prior year?

- ⬭ 1966
- ⬭ 1967
- ⬬ 1968
- ⬭ 1969
- ⬭ 1970

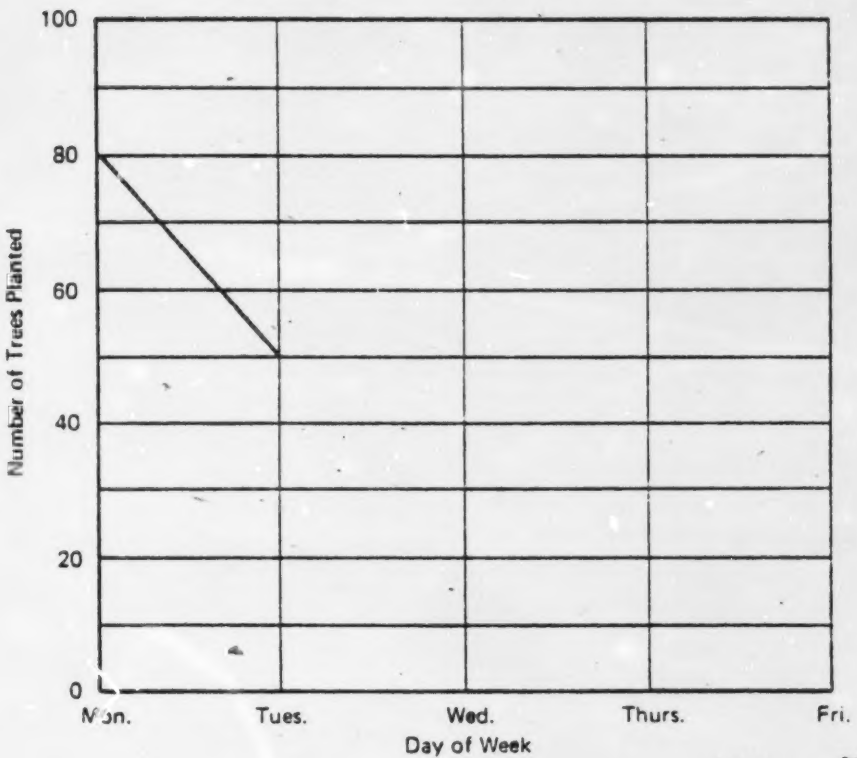
- ⬭ I don't know.

AGE 17 % 80

MC
I06 Here is a table that shows the number of trees planted along a highway in a week.

Days of the Week	Monday	Tuesday	Wednesday	Thursday	Friday
Number of Trees Planted	80	50	60	90	75

On the diagram below, draw a line graph to show the total number of plantings throughout the week. The first two days' plantings have been drawn for you. Use the ruler you have been given to draw the graph.



AGE	%
13	39
17	67
Adult	55

Scoring: All points correctly plotted; i.e., even numbers at the cross point (within 1/8 unit) and the odd number within 1/4 of a unit. Lines must be straight.

WHEAT PRODUCTION FOR FIVE COUNTRIES, 1910-1960
(IN MILLIONS OF BUSHELS)

	1910	1920	1930	1940	1950	1960
COUNTRY A	1,310	1,550	1,810	2,040	2,310	2,550
COUNTRY B	440	480	610	820	980	1,200
COUNTRY C	340	395	440	580	710	970
COUNTRY D	205	230	305	370	390	415
COUNTRY E	60	70	75	140	265	380

MC
I07 How much wheat was grown by Country C in 1920?

- ⬭ 230 bushels
- ⬭ 395 bushels
- ⬭ 230,000,000 bushels
- ⬬ 395,000,000 bushels
- ⬭ 970,000,000 bushels

- ⬭ I don't know.

AGE 17 | % 68

MC
I08 The graph on the opposite page shows the monthly production of Company X during 1971.

A. The greatest drop in production from one month to the next occurred between what two months?

AGE	%
13	45
17	72
Adult	63

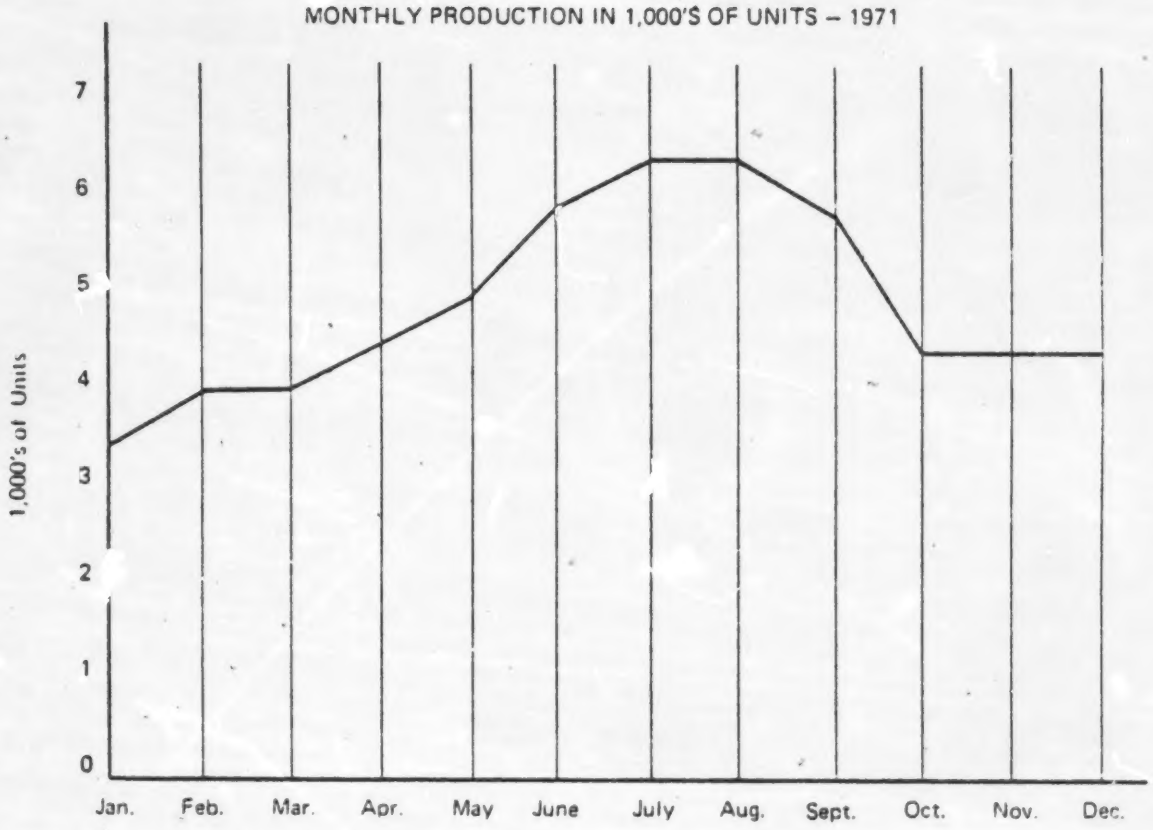
ANSWER September to October

B. The difference between maximum and minimum monthly production during 1971 was approximately how many units?

AGE	%
13	7
17	22
Adult	25

ANSWER a number from 2500 to 3500

(MC-108 continued)



60

* GPO: 1978—777-133